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IN THE

Supreme Court of the United States

STATE OF MICHIGAN, ET AL.,

Petitioners,

v.

ENVIRONMENTAL PROTECTION AGENCY,

Respondent.

On Writ of Certiorari to the United States Court of Appeals for the District of Columbia Circuit

BRIEF FOR THE CATO INSTITUTE AS *AMICUS CURIAE* IN SUPPORT OF PETITIONERS

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QUESTION PRESENTED

Whether the Environmental Protection Agency unreasonably refused to consider costs in determining whether it is "appropriate" to regulate hazardous air pollutants emitted by electric utilities.

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INTEREST OF THE *AMICUS CURIAE*[1]

The Cato Institute is a nonpartisan public policy research foundation dedicated to advancing the principles of individual liberty, free markets, and limited government. Cato's Center for Constitutional Studies was established in 1989 to help restore the principles of limited constitutional government that are the foundation of liberty. Toward those ends, Cato publishes books and studies, conducts conferences, files briefs in the courts, and produces the *Cato Supreme Court Review*.

Cato's Center for Study of Science was founded in 2011 to ensure that environmental and health regulations are supported by sound scientific research. Its director, Patrick H. Michaels, Ph.D., served as a professor of Environmental Sciences at the University of Virginia for 30 years, as president of the American Association of State Climatologists, and as program chair for the Committee on Applied Climatology of the American Meteorological Society.

This case implicates Cato's longstanding belief that the courts must exercise appropriate oversight of administrative agencies to ensure that they remain within their statutory remits.

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[1]Pursuant to Rule 37.6, counsel for the *amicus curiae* certifies that no counsel for any party authored this brief in whole or in part and that no person or entity other than the *amicus curiae* or its counsel made a monetary contribution intended to fund the brief's preparation or submission. Letters from the parties consenting to the filing of this brief are filed with the clerk.

INTRODUCTION AND SUMMARY OF ARGUMENT

Yes, it was obviously unreasonable for the Environmental Protection Agency to ignore the massive cost of regulating power plants when determining whether such regulation would be "appropriate." *Amicus* therefore joins the petitioners' arguments on that score. This brief addresses a closely related question that is essential to the Court's understanding of the underlying statutory dispute: *why* did EPA choose to ignore costs?

The answer is that EPA could achieve its longstanding goal of comprehensively regulating utility-sector emissions free from the limitations of other Clean Air Act programs only if it ignored the costs of its actions. Of course, EPA never comes right out and says that, but the agency has been surprisingly candid about the tenuous nature of the finding of risk to human health underlying its "appropriate and necessary" finding, which triggered regulation, and about its overriding focus on other power-plant emissions that are not (directly) subject to regulation under Section 112.

In short, EPA used U.S. power plants' mercury emissions—which, by the agency's own scientific assessment, have basically no impact on human health—as a Trojan horse for regulation of those plants' particulate-matter emissions, so as to escape the limitations of regulating those emissions through generally applicable National Ambient Air Quality

Standards ("NAAQS"), as the agency has done for decades.

This brief proceeds in three sections. The first reviews EPA's scientific assessment of the nature and risk to human health of mercury emissions from U.S. power plants. As the agency recognized, those emissions constitute only a miniscule proportion—about half of one percent—of global emissions and pose no measured risk to human health themselves. Accordingly, regulating them promises little or no benefit. Instead of accepting that conclusion and proceeding accordingly by declining to regulate, the agency employed a series of implausible assumptions and hypothetical scenarios to contrive a slight risk to the health of the children of "women in subsistence fishing populations" who consume enormous quantities of freshwater fish that they themselves caught. Even under EPA's questionable assumptions, the benefits of regulation are *de minimis*—as little as $500,000—and overwhelmed by costs that the agency projects to reach nearly $10 billion.

The second section describes how EPA used Section 112 regulation—triggered by mercury emissions—to target power plants' emissions of particulate matter, which (not being a "hazardous air pollutant") is not subject to Section 112. Nearly all of the rule's projected benefits are ascribed by the agency to reductions in particulate-matter emissions, which the rule regulates directly as a "surrogate" for substances that actually are subject to Section 112. This is consistent with EPA's many recent rulemakings

targeting the utility sector, virtually all of which have used particulate-matter emissions as a basis for imposing costly control requirements on a class of facilities that the agency seeks to phase out.

The final section explains why EPA would take such a convoluted approach. Regulating particulate-matter emissions through NAAQS requires EPA to cede control of the decisions of which industrial sources should be required to control emissions—and if so, how—to the states. The states are, in turn, free to permit emissions that are consistent with their and their citizens' policy preferences, whether or not they align with EPA's priorities. By proceeding under Section 112, EPA is able to circumvent these statutory limitations on its authority and directly achieve its intended goal: imposing new requirements on coal-fired power plants.

The Court should reject this sleight of hand and enforce the Clean Air Act's limits on EPA's authority and discretion. The Mercury and Air Toxics Standards ("MATS") rule should be vacated.

ARGUMENT

I. The Mercury-Related Benefits of Regulating Power Plants Are *De Minimis* and Could Not Possibly Justify a Reasonable "Appropriate and Necessary" Finding

EPA found that the potential health risk of U.S. power plants' mercury emissions justifies their regulation under Section 112 of the Clean Air Act. But

EPA's own scientific analysis shows that mercury, once emitted, circulates globally and that domestic power plants' contribution to the global pool of mercury in the atmosphere is miniscule—about one half of one percent and falling. Rather than accept its own conclusion that even eliminating those emissions entirely would have little or no impact on human health, EPA contrived hypothetical scenarios, based on loaded assumptions, to find some health risk that could justify regulation. Yet, even accepting the agency's implausible assumptions and scenarios, its projection of the benefits of regulation is still *de minimis* and dwarfed by projected costs.

A. U.S. Power Plants' Mercury Emissions Contribute Only a Tiny Fraction to Global Deposition

Unlike nearly all other pollutants regulated under the Clean Air Act, mercury emissions have little localized impact. Instead, as with greenhouse gases, mercury pollution is a global phenomenon. Mercury "cycles in the environment as a result of [both] natural and human (anthropogenic) activities." Power plants emit mercury primarily in its gaseous elemental form. Proposed Rule, 76 Fed. Reg. 24,976, 24,499–25,000, 25,003/1 (May 3, 2011); Final Regulatory Impact Analysis ("RIA") at 2-9. This elemental mercury "does not quickly deposit or chemically react in the atmosphere, resulting in residence times that are long enough to contribute to global scale deposition." RIA at 4-3. It "circulates in the atmosphere for up to a year, and, hence, can be widely dis-

persed and transported thousands of miles from likely sources of emission." 76 Fed. Reg. at 24,983/1. Indeed, EPA acknowledges that Asia, being "immediately upwind of North America...[,] affects U.S. [mercury] deposition significantly and also affects it the most compared to other regions." Final Rule, 77 Fed. Reg. 9,304, 9,338/2 (Feb. 16, 2012).[2]

After circulating in the atmosphere for months or years, mercury eventually precipitates and is deposited onto the Earth's land and water surfaces. 76 Fed. Reg. at 25,000/1; RIA at 4-3. This process is known as "wet deposition," and it occurs largely with rain and snowfall. Microbial action then converts deposited mercury into methylmercury. *Id.* This substance, in turn, can be "taken up by aquatic organisms," and it accumulates in greater concentrations as organisms higher up the food chain consume those lower down. (In scientific lingo, it "biaoaccumulates up the aquatic food web.") *Id.* "[T]he predominant exposure pathway by which humans are affected by [methylmercury]...is by ingestion of fish containing" it. 76 Fed. Reg. at 24,999/3. As discussed further below, it is by modeling this "predominant exposure pathway"—as it affects certain hypothetical populations of subsistence fishers—that EPA both justifies Section 112 regulation for U.S. power

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[2] Up to 36 percent of total mercury deposition in North America is due to emissions from East Asia. C.J. Lin, et al., Estimating mercury emission outflow from East Asia using CMAQ-Hg, 10 Atmos. Chem. Phys. 1853, 1854, 1861 (2010).

plants and projects all the quantified mercury-related benefits of its rule.

But anthropogenic mercury emissions from all U.S. sources (including power plants) comprise only a tiny fraction of the global pool of atmospheric mercury that is deposited in the United States. EPA estimates that U.S. anthropogenic mercury emissions "contribute[] 5 percent to global anthropogenic [mercury] and 2 percent [of] the total global [mercury] pool." *Id.* at 24,978/3. That amounts to 105 tons in 2005, out of global emissions of 2,100 tons. *Id.* at 24,978 n.2. And the U.S. share is rapidly shrinking, having gone "from 10 percent in 1990 to 5 percent in 2005, due to reductions in U.S. emissions and increases in emissions from other countries." *Id.* at 25,002/1.

The portion of global anthropogenic mercury emissions attributable specifically to U.S. power plants is considerably smaller. EPA estimates that U.S. power plants emitted 53 tons of mercury in 2005—about half of total domestic emissions—and projected that they would emit just 29 tons in 2016, without regulation under Section 112.[3] 76 Fed. Reg. at 25,002/2–3 & Table 3. *See also* RIA at 2-7, Table 2-5. This means that U.S. power plants accounted for just 2.5 percent of global anthropogenic emissions in 2005

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[3] And the projected reduction in emissions between 2005 and 2016 may be conservative. EPA acknowledges that it has previously "substantially" underestimated declines in U.S. power plants' mercury emissions. Revised Mercury Risk TSD at 8.

and should account for approximately half that, or less, by 2016.[4]

But the portion of *total* global emissions (both natural and anthropogenic) attributable to U.S. power plants is even smaller still. This is because a substantial portion of global emissions are attributable to natural sources, such as volcanoes. 76 Fed. Reg. at 25,003/1; RIA at 4-22. EPA cites "estimates of total global [mercury] emissions...rang[ing] from 7,300 to 8,300" tons per year. 76 Fed. Reg. at 25,001–02. Therefore, domestic power plants were responsible for 0.6 to 0.7 percent of total emissions in 2005, with that range falling to 0.3 to 0.4 percent by 2016.

EPA's modeling of mercury deposition in U.S. watersheds confirms that the contribution from U.S. power plants is slight. *See* Revised Mercury Risk TSD at 64–65 & Table 2-2. The agency estimates that the median "percent of total mercury deposition attributable to U.S. [power plants]" in a given watershed was 1 percent in 2005 and will be the same in 2016—that is, roughly in proportion to the U.S. share of global emissions. *Id.* at 65, Table 2-2.[5]

In sum, as EPA has acknowledged, "U.S. [mercury] deposition is generally dominated by sources other than U.S. [power plants]." *Id.* at 65. Or, as the agen-

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[4] Less, if non-U.S. anthropogenic emissions continue their rise.

[5] Moreover, the agency acknowledges that its risk analysis oversampled watersheds with higher-than-average deposition from U.S. power plants. *See* 77 Fed. Reg. at 9,356/1–2.

cy has also put it, "global sources of [mercury] deposition account for a large percentage of total [mercury] deposition," 77 Fed. Reg. at 9,343/2, and "U.S. [power plants] contribute only a small fraction of total [mercury] deposition in the U.S.," *id.* at 9,355/3. Simply put, the emissions that EPA addressed in its "appropriate and necessary" finding are, by the agency's own estimation, little more than a drop in the global bucket.

B. EPA Was Forced To Adopt Arbitrary and Implausible Assumptions To Find Any Health Justification for Regulation

Given U.S. power-plant emissions' slight contribution to mercury deposition, common sense would suggest that reducing or even eliminating them could have little or no appreciable effect on public health. And that is borne out by EPA's analysis. To demonstrate any health effect at all that might justify regulation, EPA was forced to rely on a series of implausible assumptions and hypothetical scenarios.

1. Mercury Deposition

EPA projects that Section 112 regulation will reduce U.S. power-plant mercury emissions in 2015 from the base case of 29 tons per year to 6 tons per year, a reduction of 23 tons. 76 Fed. Reg. at 25,073, Table 21. *See also* RIA at 3-10, Table 3-4 (reduction from 28.7 to 8.8 tons for all power plants and from 26.6 tons to 6.6 tons for power plants covered by rule). In the context of the global emission figures discussed above, this 23-ton reduction represents the

elimination of approximately 0.3 percent of total annual global mercury emissions. Because U.S. deposition due to domestic emissions is roughly proportional to U.S. sources' share of global emissions, *see supra* § I.A, this reduction in emissions could be expected to reduce domestic mercury deposition by substantially less than a single percentage point.

Accordingly, regulation would have little benefit in terms of reducing human exposure to mercury and thereby reducing risks to human health. The agency admits as much. It explains that, because a "relatively small fraction of total mercury deposition [is] contributed by U.S. [power plants] on average across the modeled watersheds....even substantial reductions in U.S. [power-plant] deposition...[are] unlikely to substantially affect total risk." Proposed Mercury Risk TSD at 53. *See also* 77 Fed. Reg. at 9,356/2.

2. Hypothetical Populations

For that reason, a straightforward estimate of the health impact of regulation would have found no material risk to be remedied. So, to justify regulation, EPA modeled the mercury exposure of hypothetical populations of women that the agency projects to consume extreme quantities of the most contaminated fish from the most contaminated bodies of water and then estimated the potential effect of this exposure on their hypothetical children's neurological development *in utero*. The agency is quite clear that this approach "is not a representative population-weighted assessment of risk." Revised Mercury Risk TSD at 2. Instead, per the agency, "the primary ob-

jective is to determine whether individuals exposed to [mercury] emitted from U.S. [power plants] through high-end consumption of freshwater self-caught fish have the potential to experience significant risk." *Id.* at 6. In other words, the agency's threshold for regulation was not even plausibility, but *conceivability* of risk.

And it labored mightily to meet even that mark. The agency focused its attention on "women of childbearing age in subsistence fishing populations who consume freshwater fish that they or their family caught." 76 Fed. Reg. at 25,007/2. But it actually did not attempt to observe or verify the size, fish-consumption rates, mercury-exposure level, health effects, or even the *very existence* of these populations.[6] Instead, EPA assumed the existence, charac-

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[6] *See, e.g.*, Revised Mercury Risk TSD at viii ("Because we do not have data available on the distribution of subsistence fishing populations in all watersheds in the U.S., we modeled a hypothetical female subsistence consumer at those watersheds where we have fish tissue data and where we believe subsistence fishing activity has the potential to occur."); *id.* at 9 ("Because it is not possible to enumerate these high-end fisher populations, the risk estimates that are generated are not population-weighted and instead are given a uniform weight for each watershed-level risk estimate generated."); *id.* at 34 n.32 ("While we cannot enumerate the subsistence fishers directly, we can use the demographic data to determine if the underlying source population is present in the vicinity of a watershed with fish tissue [mercury] data."); *id.* at 34 n.33 ("[W]e believe it *reasonable to assume* that the typical female subsistence fish consumer scenario (and associated fishing activity) *could poten-*

teristics, and fishing activity of these populations, and then, relying on further assumptions, modeled the health risks they could face from consuming fish containing methylmercury in 2016. *See generally* Revised Mercury Risk TSD at 14, Fig. 1-2 (Flow Diagram of Risk Analysis) (diagramming "major analytical steps and associated modeling elements").

Here's how it works: EPA first conceived "seven female subsistence fish consumer scenarios." *Id.* at 15. These "scenarios" were based on data from a few surveys of fish-consumption patterns among particular demographic groups, in particular locales, that are known for catching and consuming hugely disproportionate quantities of fish. *See id.* at 15, 32 & Table 1-5.[7] It also created a general "typical female subsistence fish consumer scenario" (based on one of the surveys, so not in fact "typical" with respect to the population at large), as well as six scenarios tailored to specific racial and economic subgroups, based on the localized surveys. *Id.* at 32, 35. The "typical" scenario was run for all U.S. watersheds with fish-tissue mercury data, reflecting the agency's "assumption that, given the generalized nature of

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tially occur at some subset of the watersheds with fish tissue [mercury] data.") (emphases added).

[7] The three studies examined white and black populations in South Carolina; certain Hispanic and Asian-American populations in California; and certain tribal populations in the Great Lakes region. *Id.* at 32. The "typical" scenario used consumption rates from the first of these studies. *See id.* at 35.

[that] scenario, it is reasonable to assume that it could potentially occur at any watershed with fish tissue [mercury] data." 77 Fed. Reg. at 9,315/1. The demographically differentiated scenarios were run only for watersheds that intersected with at least one U.S. Census tract containing at least 25 individuals similar to those profiled in the scenario. *See* Revised Mercury Risk TSD at 34. Thus, the agency would assume that, if a Census tract in a watershed area contained at least 25 Asian-Americans, that population was a "high-end fisher population" catching and consuming unusually large quantities of wild fish. *Id.* at 9.

Having identified hypothetical "female subsistence consumer" scenarios for each watershed, the agency next "defined high-end (subsistence) self caught fish consumption rates for those scenarios." *Id.* at 35. These "high-end rates" were defined by figures drawn from the 90th or (where available) 99th percentile of consumption rate as reflected in the surveys. *Id.* at x, 16. For the "typical" scenario those figures range from 99 to 300 pounds of fish per year. *See id.* at 81, Table 2-6. So for each hypothetical "typical" or "high-end fisher population," EPA assumed the existence of women who consume the maximum conceivable amount of self-caught fish.[8]

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[8] In the Final Rule, EPA acknowledged that this assumption represents the extreme end of potential consumption:

> The EPA acknowledges that the focus of the [Mercury] Risk TSD is characterizing risk for the groups like-

In sum, rather than consider health impacts on any actual person or population, EPA contrived hypothetical women of child-bearing age consuming enormous amounts of self-caught fish from watersheds around the nation.

3. Exposure Modeling

EPA's next step was to show that at least some of these hypothetical highest-of-the-highest self-caught fish consumers actually faced a health risk. That analysis proceeded in two stages: exposure modeling (how much mercury are these hypothetical persons consuming?) and risk modeling (could that amount possibly affect human health?).

To conduct the exposure modeling, EPA first needed to estimate the amount of mercury in fish from different watersheds. After filtering out certain tissue samples and watersheds for various reasons (e.g., exposure to active gold mines, which are a substantial source of mercury), the agency was left with

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> ly to experience the greatest U.S. [power plant]-attributable [mercury] risk, which are subsistence fishing populations active at inland freshwater lakes and rivers. Specifically, within that subsistence fishing population, the EPA is interested in those individuals who are most at-risk, which includes those who consume the most fish. For that reason, the EPA considered a range of high-end fish consumption rates including the 99th percentile representing the most highly-exposed individuals.

77 Fed. Reg. at 9,348/3.

35,567 tissue samples from 3,141 watersheds, out of about 88,000 watersheds total.[9] *Id.* at 24. For one-quarter of these watersheds, the agency had only a single fish-tissue sample. *See id.* at 28, Fig. 1-7. Where there were multiple samples from a watershed, EPA used the 75th-percentile fish-tissue value—that is, containing significantly above-average amounts of mercury—"as the main basis for exposure and risk characterization." *Id.* at 26.

Assuming a linear relationship between mercury deposition and fish-tissue mercury concentration at a given watershed, the agency projected what those concentrations would be in 2016. *Id.* at 43–44. At this point, the agency had projections of how much methylmercury would be found in fish tissue at the watersheds.

To complete the exposure phase of the analysis, EPA needed to estimate the methylmercury exposure for the "female subsistence consumer[s]...active at each watershed." *See id.* at 14, Fig. 1-2. This was relatively straightforward: it had already estimated consumption rates of its hypothetical 99th-percentile fish consumers in its hypothetical "high-end fisher populations," as described above. But rather than simply multiply—amount of fish times the projected amount of mercury in a unit of fish—the agency also

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[9] EPA acknowledged that its selection of watersheds was not "representative" of mercury pollution and was "likely to be biased towards locations with higher [mercury] fish tissue concentrations." *Id.* at 19.

boosted its mercury estimates by a factor of 1.5, which it called a "cooking adjustment factor."[10] *Id.* at 41. After making a few additional adjustments, the agency arrived at "estimates of annual-average daily [methylmercury] exposure per kg body weight." *Id.* at 42.

4. Risk Modeling

Having estimated its hypothetical high-end fish consumers' exposure to methylmercury, EPA's next task was to determine whether that exposure was associated with any potential health risk.

The first step was to identify the "reference dose" for methylmercury. This is "the amount of a chemical which, when ingested daily over a lifetime, is anticipated to be without adverse health effects to humans, including sensitive subpopulations." 77 Fed. Reg. at 9,307/3. After throwing out one study that failed to show any health effect at low levels of exposure (like those at issue here), the agency calculated a reference dose of 0.1 microgram[11] per kilogram of body weight per day.[12] *See* Revised Mercury Risk

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[10] EPA acknowledged that this factor could be as low as 1—that is, no effect at all. *See id.* at 41, 100, Table 2-15, row (H); 77 Fed. Reg. at 9,347/2–3.

[11] A microgram is one one-millionth of a gram, or one one-thousandth of a milligram.

[12] The reference dose is derived from "the three extant large studies of childhood effects of in utero exposure," from the "Faroe Islands, New Zealand, and an integrative measure including data from Seychelles." 77 Fed. Reg. at 9,351/1. The

TSD at 52, Fig. 1-9; Appropriate and Necessary Finding, 65 Fed. Reg. 79,825, 79,827 (Dec. 20, 2000).

The second step was to calculate a "hazard quotient" for each of its hypothetical high-end female fish consumers of childbearing age at watersheds around the country. 76 Fed. Reg. at 25,006 n.92. This is simply exposure divided by the reference dose, such that a value above one (i.e., exposure is greater than the reference dose) indicates a "potential public health hazard." Revised Mercury Risk TSD at 43.

Based on this methodology, EPA determined (somewhat unsurprisingly) that "almost all" of the watersheds that it considered were "at risk" because at least one hypothetical high-end fish consumer at each would consume enough self-caught fish to surpass the reference dose and therefore face a hazard quotient of greater than one. 76 Fed. Reg. at 25,015/3.

5. Attribution to U.S. Power Plants

Next, EPA estimated the proportion of these hazard quotients attributable to projected U.S. power-

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Seychelles study, however, "did not confirm any harm on children due to [methylmercury] exposure." *Id.* at 9,350/2. But EPA rejected reliance on that study because it failed to show "an association between [methylmercury] exposure and adverse effects." *Id.* at 9,351/2. In other words, the agency discarded the study's conclusions because it did not find the relationship that EPA anticipated.

plant mercury emissions in 2016. *See* Revised Mercury Risk TSD at 43–44. The agency here used the same mercury-deposition modeling that it had used to project 2016 fish-tissue mercury concentrations at each watershed. *Id.* at 14, Fig. 1-2.

EPA could have used these figures to estimate the percentage of watersheds "at risk" *because of U.S. power plants' mercury emissions*—that is, watersheds where emissions from U.S. power plants can be identified as the marginal factor causing them to present a potential risk to high-end fish consumers.

But that's not what it did. Instead, it calculated the number of watersheds where U.S. power plants "contributed at least 5 percent of the total [mercury] deposition and related [methylmercury] exposures at a watershed, or contributed enough [mercury] deposition resulting in potential [methylmercury] exposures above the [reference dose], regardless of the additional deposition from other sources of [mercury] deposition." 76 Fed. Reg. at 25,015–16. *See also* 77 Fed. Reg. at 9,366/1. In other words, it included "at risk" watersheds where deposition attributable to U.S. power-plant emissions equaled or exceeded 5 percent of the estimated total, regardless of whether that deposition was sufficient to *cause* the "at risk" designation.[13]

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[13] Or, put differently, regardless of whether eliminating entirely deposition attributable to U.S. power plants would cause the watershed to no longer be "at risk." On that point, EPA concedes that Section 112 regulation will do little to protect its hy-

Using this methodology, and assuming "99th percentile fish consumption" (that is, its absolutely most implausible scenario), it arrived at this figure: 29 percent. Revised Mercury Risk TSD at 86 & Table 2-10. And that figure, whatever it represents, was its basis for EPA's finding that "U.S. [power plants] are causing a hazard to public health." 76 Fed. Reg. at 25,016/1. *See also* 77 Fed. Reg. at 9,311 n.15. And that, in turn, rendered it "appropriate" to regulate those plants' emissions. *Id.* at 9,311/2–3.

C. Even Under EPA's Assumptions, the Rule's Mercury-Related Benefits Are *De Minimis* and Overwhelmed by Its Costs

Had EPA not ignored the costs of regulation in making its "appropriate and necessary" determination, it might have compared them with the mercury-related benefits of regulation. Although the agency did not undertake this comparison, it did supply the necessary elements.

The only mercury-related benefit of regulation that EPA believed could be expressed in monetary terms is a reduction in IQ points lost. *See* RIA 4-1 to 4-2. To begin with, the agency estimated the number of children who would be born to the hypothetical high-end self-caught fish-consuming female populations discussed above and then modeled the mercury exposure suffered *in utero* by those children. The agency

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pothetical "at risk" populations. Revised Mercury Risk TSD at xi, 111.

projected that some 240,000 children would be affected and that, in its 2016 scenario, each would suffer a mercury-induced loss of 0.10 IQ points, on average. *Id.* at 4-55, 4-67. Collectively, this would amount to a loss of 24,419 IQ points, due to exposure to fish-borne mercury from all sources. *Id.* at 4-54.

To be sure, almost none of that could be attributed to U.S. power plants—due to their small contribution to total deposition—so the agency calculated the proportional number of IQ points that would be "saved" per year through regulation: 510.8, across the entire population of children of hypothetical high-end fish consumers. *See id.* at ES-5, Table ES-3. Each of those children would enjoy an average "avoided IQ loss" of 0.00209 IQ points. *Id.* at 4-3. Thus, EPA projects that the rule will prevent each child from suffering about one-fiftieth of the estimated IQ loss (already *de minimis*) that it attributes to all mercury exposure.

To put that in context, the mean IQ-test score is 100, with a standard deviation of approximately 15 points and a measurement error of 5 points. *Hall v. Florida*, 134 S. Ct. 1986, 1994–95 (2014) (citing Am. Psych. Ass'n, Diagnostic & Statistical Manual of Mental Disorders 37 (5th ed. 2013)). Differences of one tenth of one point, let alone two thousandths, are not measurable and do not reflect any difference in cognitive function. *Cf. id.* at 1995 ("A score of 71, for instance, is generally considered to reflect a range between 66 and 76 with 95% confidence and a range of 68.5 and 73.5 with a 68% confidence."). The

agency does not explain its basis for attributing *any* significance to a difference in IQ of 0.00209 points, nor does it show that avoiding such an IQ loss could have *any* impact on *any* individual's future earnings.

Nonetheless, EPA proceeded to translate this savings into economic terms, projecting a total annual benefit due to "avoided IQ loss" of $500,000 to $6 million (in 2007 dollars), depending on the discount rate applied. *See* RIA at ES-6, Table ES-4. To reach that figure, EPA adopted the estimate, based on lead-exposure studies and Department of Education data of the annual income gain attributed to each additional year in school, that the loss of an IQ point reduces an individual's annual income by $892 to $1,958. *Id.* at 4-47 to 4-48, 4-90. *See also* 77 Fed. Reg. at 9,428/2. And this, the agency acknowledges, may be overly optimistic due to its assumption that emissions reductions will immediately translate into reductions in methylmercury levels. RIA at 4-3 n.1.

The costs of regulation, which EPA also estimated, are somewhat higher. According to the agency, the annual "total social costs" of Section 112 regulation are $9.6 billion, "approximated by the sum of the compliance costs and monitoring and reporting costs." 77 Fed. Reg. at 9,305–06 & Table 2. So the total costs outweigh the benefits by a factor of between roughly 1,600 to 1 and 19,000 to 1. Whether viewed in isolation or compared to the cost of regulation, the benefits that EPA projects—even assuming the correctness of all of the agency's assumptions—can fairly be characterized as *de minimis*.

II. EPA's Actual Target Was Power Plants' Particulate-Matter Emissions

EPA's rulemaking publications, related regulatory actions, and public statements suggest why the agency would choose to establish a regulatory program that—according to the agency's own scientific assessment—addresses a non-existent risk at enormous cost. By all appearances, mercury was a Trojan horse used to justify regulation under Section 112, when EPA's real focus was particulate-matter emissions by power plants, which the agency has targeted across numerous rulemakings in recent years. The rule here fits that pattern, claiming enormous benefits almost exclusively from reductions in particulate-matter emissions and directly regulating such emissions as a "surrogate" for certain hazardous air pollutants ("HAPs").

A. Particulate Matter Co-Benefits Have Provided the Primary or Only Economic Justification for EPA's Recent Air Rules

Whether or not EPA is conducting a "war on coal," as some maintain,[14] the agency's recent rulemakings have targeted coal-fired power plants in an unprecedented fashion. The president has identified "changing the way we use energy" through EPA regulation

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[14] *See, e.g.*, Rep. Jim Sensenbrenner, President Obama's War on Coal (June 4, 2014), *available at* http://sensenbrenner.house.gov/news/documentsingle.aspx?DocumentID=383480.

as a national priority.[15] And his views on coal-fired generation are well-known: "[i]f somebody wants to build a coal-fired power plant, they can. It's just that it will bankrupt them."[16]

Although the administration has stated that it opposes coal-fired plants due to their carbon-dioxide emissions,[17] EPA's stated justification for targeting power plants in recent rulemakings has been their particulate-matter emissions. "Particulate matter (PM) is an air pollution term for a mixture of solid particles and liquid droplets found in the air." EPA, Particulate Matter Research.[18] Since 1971, it has

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[15] See Remarks by the President on Climate Change (June 25, 2013), *available at* http://www.whitehouse.gov/the-press-office/2013/06/25/remarks-president-climate-change.

[16] Erica Martinson, Uttered in 2008, still haunting Obama in 2012, Politico Pro (Apr. 5, 2012), *available at* http://www.politico.com/news/stories/0412/74892.html.

[17] *E.g.*, Presidential Memorandum: Power Sector Carbon Pollution Standards (June 25, 2013), *available at* http://www.whitehouse.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards (directing EPA to regulate carbon emissions from new and existing power plants under Clean Air Act); EPA Administrator Gina McCarthy, Remarks on Carbon Pollution Standards for New Power Plants (Sept. 20, 2013), *available at* http://yosemite.epa.gov/opa/admpress.nsf/8d49f7ad4bbcf4ef852573590040b7f6/a2313a88f5e593bc85257bf1006ca2ba!OpenDocument; The White House, Climate Change and President Obama's Action Plan, *available at* http://www.whitehouse.gov/climate-change.

[18] *Available at* http://www.epa.gov/airscience/air-particulatematter.htm.

been regulated under Sections 108–110 of the Clean Air Act, as part of the National Ambient Air Quality Standards ("NAAQS") regime. *See* 36 Fed. Reg. 8,186 (Apr. 30, 1971) (promulgating national primary and secondary PM standards). It is currently subject to two separate sets of standards, for "PM_{10}" and for "$PM_{2.5}$," labels which refer to particles smaller than 10 microns and those smaller than 2.5 microns.[19]

EPA's cost-benefit models score reductions in particulate-matter emissions favorably, allowing the agency to claim enormous benefits for regulations that reduce such emissions. Generally, these are "co-benefits," which is how EPA refers to incidental reductions in emissions of a substance that is not the stated target of regulation. *See* 77 Fed. Reg. at 9,305/3.

Particulate-matter co-benefits are credited with much, and in some instances all, of the claimed monetized health benefits of recent EPA air rules. EPA calculates these particulate-matter co-benefits by inferring a causal connection between regional ambient concentrations of particulates and regional health, particularly as concerns lung function. *See generally* EPA, Co-Benefits Risk Assessment (COBRA) Screening Model (Sept. 2014);[20] RIA at 5-11. The agency projects that health will be improved,

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[19] A micron, or micrometer, is one one-millionth of a meter.

[20] *Available at* http://epa.gov/statelocalclimate/resources/cobra.html.

up to and including the avoidance of premature deaths, in proportion to the decrease in particulate-matter emissions resulting from a given rule. In other words, it assumes a linear relationship between reductions and health benefits. *See generally* RIA 5-1 to 5-10. Those benefits are then assigned an economic value. *See id.* at 5-11 to 5-12. Outside scientists have criticized this approach as unsupported by sufficient evidence of a causal link between particulate reductions and health benefits at the relatively low levels modeled by EPA.[21]

The MATS rule claims enormous "co-benefits" from the reduction of particulate matter and related substances, despite being promulgated under statutory authority that does not address that substance. EPA projects total monetized benefits from the MATS rule of between $37 and $90 billion. 77 Fed Reg. at 9,306, Table 2. Of these projected benefits, almost all

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[21] A Harvard toxicologist testifying before Congress described EPA's methodology as "highly imprecise," faulting the agency for failing to conduct "an evaluation of all available relevant science," cherrypicking "*two* observational epidemiology studies conducted when air pollution levels were generally above current standards," and "assum[ing] a causal relationship" between particulate reductions and health benefits even though "dozens of other epidemiology studies are available and many report no such correlations." This amounts, she concluded, to "a biased assessment of the available data." *The American Energy Initiative: A Focus on What EPA's Utility MACT Rule Will Cost U.S. Customers: Hearing Before the Subcomm. on Energy & Power, H. Comm. on Energy & Commerce* (2012) (testimony of Dr. Julie Goodman).

of them are attributed to projected incidental reductions in power plants' particulate-matter emissions. Specifically, EPA projects $PM_{2.5}$-related co-benefits of $36 *billion* to $89 *billion*. In fact, the only other monetized benefits are the IQ-related benefit of less than $6 *million* and climate-related co-benefits of $360 *million*. *Id.*

Any doubt as to EPA's true purpose in deciding to regulate under Section 112 is resolved by its publicity for the rule, which cites projected particulate-matter co-benefits as the rule's *primary* justification. *See, e.g.*, EPA, Mercury and Air Toxics Standards—Healthier Americans (touting projected particulate-matter-related benefits);[22] EPA Fact Sheet: Mercury and Air Toxics Standards (same).[23] These asserted benefits, most relating to pulmonary function, have nothing to do with the fractional IQ loss-avoidance the agency projects to flow from mercury reductions, the ostensible focus of its "appropriate and necessary" finding and purpose of Section 112 regulation. In this respect, EPA's press releases and "fact sheets" are a better guide to the agency's thinking than its obfuscated rulemaking publications.

This is consistent with EPA's approach in other recent air rulemakings, including those aimed at power plants. In the proposed carbon-dioxide regulations

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[22] *Available at* http://www.epa.gov/mats/health.html.

[23] *Available at* http://www.epa.gov/mats/pdfs/20111221MATSimpactsfs.pdf.

for existing power plants under Clean Air Act Section 111(d) (which the agency calls the "Clean Power Plan"), EPA projects annual net monetized benefits from the proposed rule of between $46 billion and $84 billion. *See* 79 Fed. Reg. 34,830, 34,840–41, Table 2 (June 18, 2014). Projected reductions in emissions of particulate matter and its precursors account for over half of that figure. *See id.* at 34,937–39, Tables 14–16.[24]

The Section 111(d) carbon rulemaking is only the most recent example of this trend in EPA rulemakings. *See also, e.g.*, 75 Fed. Reg. 35,520, 35,588/3 (June 22, 2010) (claiming $2.2 million in direct benefits from revised sulfur-dioxide standard and $15 billion to $37 billion in co-benefits due to reductions in particulate matter); 75 Fed. Reg. 9,648, 9,669/3 (Mar. 3, 2010) (promulgating Section 112 standards for stationary compression ignition engines used in power plants and other facilities and projecting monetized benefits only for particulate-matter co-reductions); RIA, Existing Stationary Spark Engine Hazardous Air Pollutant Rule at 1-3, Table 1-1 (Jan. 2013) (projecting monetized benefits only for incidental co-reductions of particulate matter and its

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[24] If the annual net benefits that EPA projects from the MATS rule and Clean Power Plan together ($164 billion) were a country's economic output, that country would have the 57th largest GDP in the world, falling between the Vietnam and Bangladesh. *See* 79 Fed. Reg. at 34,840, Table 2; 77 Fed. Reg. at 9,306, Table 2; World Bank, GDP (2015), *available at* http://data.worldbank.org/indicator/NY.GDP.MKTP.CD.

precursors); RIA, Industrial, Commercial, and Institutional Boilers and Process Heaters Hazardous Air Pollutant Rule (Feb. 2011), at 1-4 to 1-5, Tables 1-1 & 1-2, 7-21, Tables 7-2 & 7-3 (same); RIA, Final Ozone NAAQS at 34, Figs. S2.5 & S2.6 (July 2011) (showing particulate-matter monetized benefits greatly outweighing ozone benefits); RIA, New Source Performance Standards and Existing Source Emission Guidelines for Sewage Sludge Incineration Units at 1-3, Table 1-1, 5-10, Table 5-3 (Sept. 2010) (projecting particulate matter-related benefits of $110 to $270 million, out of total monetized benefits of $130 to $320 million).

In sum, the available evidence suggests that EPA's true purpose in pursuing Section 112 regulation here was not to reduce risks associated with mercury exposure but to target coal-fired power plants and their particulate-matter emissions.

B. The MATS Rule Directly Regulates Particulate-Matter Emissions

To call these particulate-matter-related benefits "incidental" is a bit of a misnomer, because the MATS rule actually regulates particulate-matter emissions directly. The agency treats them as a proxy or "surrogate" for measuring certain sources' emissions of metallic HAPs. *See, e.g.*, 76 Fed. Reg. at 25,027/3; *id.* at 25,030–31 ("Continuous Compliance Requirements"). *See also* 77 Fed. Reg. at 9,402/1 ("Although the objective of the emission limits we are establishing is to reduce the risks associated with HAP emissions, the limits are based in part up-

on the demonstrated capabilities of control technologies which are installed on existing sources. Except for [mercury], the best PM controls provide the best controls of metal emissions.").

This means that the MATS rule functions as a direct regulation of particulate matter, such that emittors may achieve compliance by controlling particulate-matter emissions.

III. EPA's Decision Not To Consider Cost Allowed It To Aggrandize Its Power at the Expense of States and Their Citizens

Particulate matter is a pollutant of nationwide concern that is regulated as a "criteria" pollutant under Sections 108, 109, and 110 of the Clean Air Act. As a pollutant of nationwide concern, the Clean Air Act authorizes EPA to set federal standards but grants states the authority to determine how to meet the federal standards. By refusing to consider costs when deeming it "appropriate and necessary" to regulate power plants' HAP emissions, EPA was able to circumvent the Clean Air Act's statutory bar on regulating criteria pollutants as hazardous air pollutants and to aggrandize its authority at the expense of that of the states and their citizens.

Particulate matter is subject to National Ambient Air Quality Standards. Under Section 108 of the Clean Air Act, 42 U.S.C. § 7408, EPA prepares a list of air pollutants that "cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare[,] the presence of

which in the ambient air results from numerous or diverse mobile or stationary sources." *Id.* § 7408(a)(1). The agency then issues "air quality criteria" reflecting "the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant[s] in the ambient air, in varying quantities." *Id.* § 7408(a)(2). Accordingly, pollutants regulated under this program are known as "criteria" pollutants.[25]

EPA then, under Section 109, 42 U.S.C. § 7409, prescribes and periodically revises national ambient air quality standards that, "allowing an adequate margin of safety, are requisite to protect the public health." *Id.* at § 7409(b)(1). These are "primary" standards; the agency may also promulgate "secondary" standards for the same substances to "protect the public welfare." *Id.* at § 7409(b)(2). *See generally Whitman v. Am. Trucking Assn's*, 531 U.S. 457 (2001).

Finally, under Section 110, 42 U.S.C. § 7410, states prepare "implementation plans" that lay out measures to ensure that the air-quality regions within their jurisdiction will attain the standards. *See,*

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[25] To date, EPA has listed six "criteria" pollutants: particulate matter, sulfur oxides, nitrous oxides, ozone, carbon monoxide, and lead. The agency last revisited the particulate-matter standards in 2013. 78 Fed. Reg. 3,086 (Jan. 15, 2013) (final rule) (promulgating stricter primary standard for $PM_{2.5}$ but retaining existing standard for PM_{10}).

e.g., *Util. Air Regulatory Grp. v. EPA*, 134 S. Ct. 2427, 2435 (2014).

Due to this division of authority, federal power to second-guess a state's choices as to how to control their emissions is highly limited. EPA must approve an implementation plan that will attain the national standards in the requisite time frame, regardless of whether or not the agency would prefer more stringent action or a different set of emission limitations than those prescribed by the state. *See Union Elec. Co. v. EPA*, 427 U.S. 246 (1976). Only if a state fails to submit an acceptable plan may EPA impose its own federal implementation plan, *see* § 7410(c). This program is therefore a prime example of "cooperative federalism" under the Clean Air Act.

Congress anticipated the possibility that the Section 112 program for hazardous air pollutants could be used by EPA to circumvent these limitations on its own authority and undermine state authority. It specifically precluded EPA from doing so. In Section 112(b)(2), Congress prohibited EPA from regulating criteria pollutants—like particulate matter—as hazardous air pollutants except under certain defined circumstances that EPA has not determined apply to particulate matter. 42 U.S.C. § 7412(b)(2). Congress's prohibition on surreptitious regulation of criteria pollutants in the Section 112 program was necessary to ensure that states retain their primary authority to decide how to attain the national ambient air quality standards for these criteria pollutants within their borders. Accordingly, Congress's prohi-

bition is broadly construed, extending "not only to rules that literally list a criteria pollutant as a HAP but also to any rule that in effect treats a criteria pollutant as a HAP" *Nat'l Lime Ass'n v. EPA*, 233 F.3d 625, 638 (D.C. Cir. 2000).

But EPA purposely disregarded the Clean Air Act's limitations in order to aggrandize its regulatory authority. In its "appropriate and necessary" determination, EPA claimed that it could not rely on the national ambient air quality standards program to control HAPs from coal-fired power plants because "states have the ultimate responsibility for implementing the NAAQS"; pollution-control "decisions are unique to each state"; and the agency "cannot predict with any certainty precisely how states will ensure" that necessary reductions are realized. 76 Fed. Reg. at 24,990/3. In contrast, under Section 112, the agency directly imposes requirements on sources nationwide and states play *no role* in developing and promulgating emission limits, only a ministerial role in administering the program. While EPA offered this as a reason for regulation, given that the MATS rule is a pretext for direct regulation of particulate matter from coal-fired power plants, this "basis" for EPA's decision highlights its unlawfulness.

But even then EPA's actions are suspect. The regulatory regime of Sections 108–110 is designed to provide an "adequate margin of safety...to protect the public health," 42 U.S.C. § 7409(b)(1), but the agency's reliance on particulate-matter reductions to project the benefits from air regulations of other sub-

stances promulgated under other statutory authority—here, the Section 112 hazardous air pollutants program—contravenes the overall design of the Act and casts doubt on the reasonableness of EPA's "appropriate and necessary" determination. This particularly is the case because EPA set the federal particulate-matter standard at the requisite level less than one year after the Mercury Rule, *see* 78 Fed. Reg. 3,086 (Jan. 15, 2013), casting doubt on both the appropriateness and the necessity of obtaining further reductions incidentally through Section 112 regulation of coal-fired power plants.

Congress could have enacted a statute that allows EPA to address particulate matter—or any other pollutant—in whatever manner the agency sees fit. Instead, the Clean Air Act that Congress actually enacted recognizes that "air pollution prevention...and air pollution control at its source is the primary responsibility of States and local governments." 42 U.S.C. § 7401(a)(3). EPA should not be allowed to arrogate that power to itself by twisting the language of Section 112.

CONCLUSION

The point of the MATS rule is not to reduce emissions of hazardous air pollutants from power plants, but to escape the limitations that Congress placed on EPA's authority to target particular industries and sources. The rule should be vacated.

Respectfully submitted,

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